

Name: Key

A2 CC1 Q3 Test 2 Review

SHOW ALL WORK ON SEPERATE PAPER! This review is not comprehensive. Be sure to go back and study your notes, homework, and past exams as well.

- 1) Write a polynomial equation (with integral coefficients of lowest degree) which has roots of 3 and a double root of $-\frac{1}{3}$.

Show all work.

$$y = (x-3)\left(x+\frac{1}{3}\right)\left(x+\frac{1}{3}\right)$$

$$y = (x-3)\left(x^2 + \frac{1}{3}x + \frac{1}{3}x + \frac{1}{9}\right)$$

$$y = (x-3)\left(x^2 + \frac{2}{3}x + \frac{1}{9}\right)$$

$$y = x^3 + \frac{2}{3}x^2 + \frac{1}{9}x - 3x^2 - 2x - \frac{1}{3}$$

$$y = x^3 - \frac{7}{3}x^2 - \frac{17}{9}x - \frac{1}{3}$$

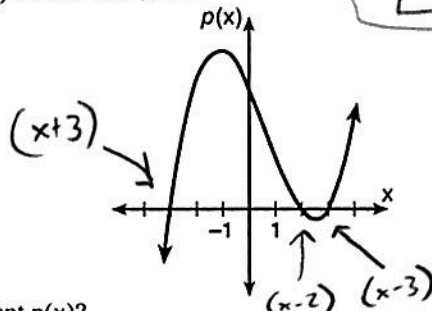
Need integers

$$y = 9\left(x^3 - \frac{7}{3}x^2 - \frac{17}{9}x - \frac{1}{3}\right)$$

$$y = 9x^3 - 21x^2 - 17x - 3$$

Answer: _____

- 2) The graph of the function $p(x)$ is sketched below.



$$(x+3)(x-2)(x-3)$$

$$(x^2-9)(x-2)$$

Which equation could represent $p(x)$?

A)

$$p(x) = x^3 - 2x^2 + 9x + 18$$

B)

$$p(x) = (x^2 + 9)(x - 2)$$

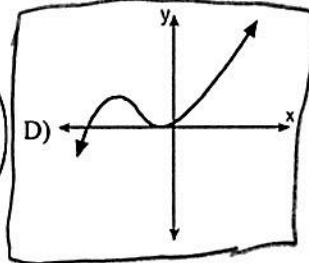
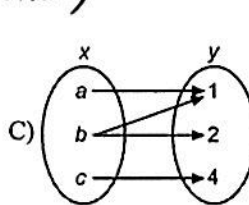
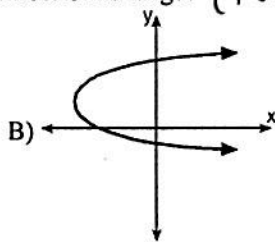
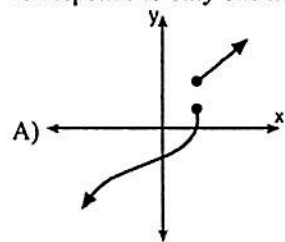
C)

$$p(x) = x^3 + 2x^2 - 9x - 18$$

D)

$$p(x) = (x^2 - 9)(x - 2)$$

- 3) Which one of the following diagrams represents a set of ordered pairs where each member of the domain corresponds to only one member of its range? (Function)



- 4) Which set of ordered pairs does not represent a function?

A) $\{(3, -2), (-2, 3), (4, -1), (-1, 4)\}$

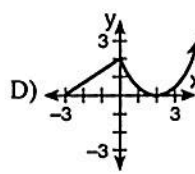
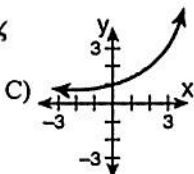
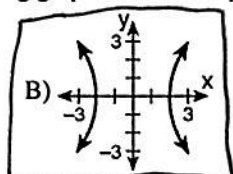
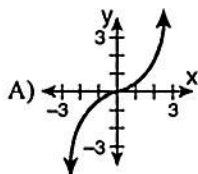
B) $\{(3, -2), (4, -3), (5, -4), (6, -5)\}$

C) $\{(3, -2), (3, -4), (4, -1), (4, -3)\}$

D) $\{(3, -2), (5, -2), (4, -2), (-1, -2)\}$

← ↑
Same x-value

- 5) Which one of the following graphs does not represent a function?



- 6) Which one of the following is an equation of a function?

A) $x^2 - y^2 = 25$

B) $x^2 + y^2 = 25$

C) $x + y = 25$

D) $x + y^2 = 25$

- 7) Given the set of ordered pairs $R = \{(-2,3), (a,4), (1,9), (0,7)\}$, which replacement for a makes this set a function? *x-values can't repeat.*

A) 4

B) -2

C) 0

D) 1

- 8) Write a definition for the term "function" and give an example.

A function is a set of ordered pairs
in which x-values do not repeat.
 $y = 3x + 5$ (line)

- 9) The function $f(x) = \frac{1}{x-3}$ is defined for all real numbers except when x equals

A) 3

B) 0

C) $-\frac{1}{3}$

D) -3

- 10) The function $f(x) = \sqrt{x-4}$ is real for what values of x ?

A) $\{x|x > 0\}$

B) $\{x|x \geq 4\}$

C) $\{x|x < 0\}$

D) $\{x|x \leq 4\}$

$x - 4 \geq 0$
 $x \geq 4$

- 11) The domain of the equation $y = \frac{1}{(x-1)^2}$ is all real numbers

A) except 1 and -1

B) except 1

C) greater than 1

D) less than 1

- 12) The domain of the real-valued function $f(x) = \frac{1}{\sqrt{x-3}}$ contains which of the following numbers?

A) -1

B) 7

C) 3

D) 2

Questions 13 through 15 refer to the following:

Find the domain and range of the given function.

13) $k(x) = \sqrt{x+4}$

Show all work.

Domain: $x \geq -4$

Range: _____

$$\begin{array}{r} x+4 \geq 0 \\ -4 \quad -4 \\ \hline x \geq -4 \end{array}$$

$$\begin{array}{r} x-3 > 0 \\ x > 3 \end{array}$$

3 makes the fraction undefined.

14) $f(x) = \frac{x+2}{x^2-9}$

Show all work.

$$\begin{aligned}
 x^2 - 9 &\neq 0 \\
 (x+3)(x-3) &\neq 0 \\
 x &\neq -3 \quad x \neq 3
 \end{aligned}$$

Domain: $x \neq \pm 3$ ~~Ranger~~ _____

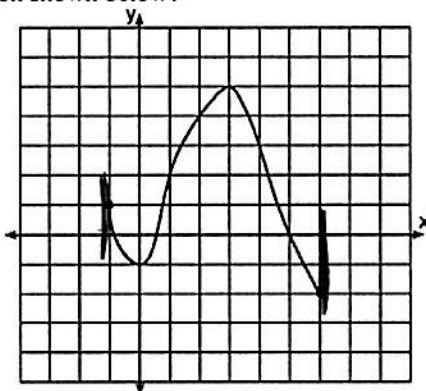
15) $g(x) = \frac{2}{\sqrt{x-3}}$

Show all work.

$$\begin{aligned}
 x-3 &> 0 \\
 +3 \quad +3 \\
 \hline
 x &> 3
 \end{aligned}$$

Domain: $x > 3$ ~~Ranger~~ _____16) What is the domain of the function shown below?

x-values left
to
right



A) $-1 \leq x \leq 6$

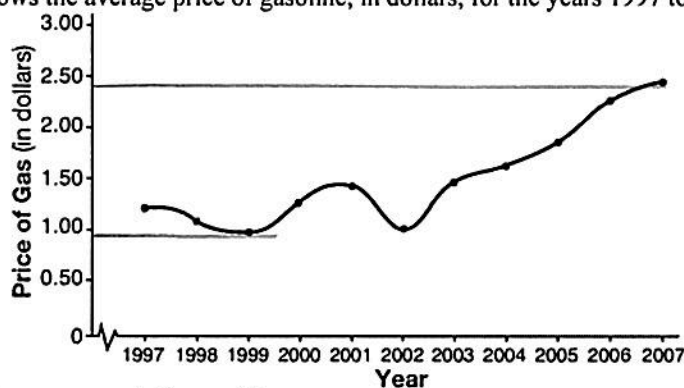
B) $-2 \leq y \leq 5$

C) $-1 \leq y \leq 6$

D) $-2 \leq x \leq 5$

- 17) The graph below shows the average price of gasoline, in dollars, for the years 1997 to 2007.

y-values
bottom to
top



What is the approximate range of this graph?

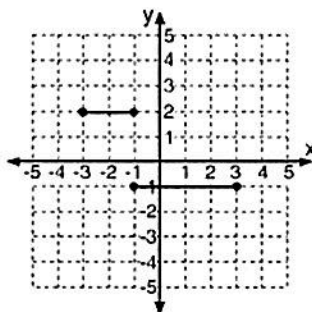
A) $0.97 \leq y \leq 2.38$

B) $1.27 \leq y \leq 2.38$

C) $1999 \leq x \leq 2007$

D) $1997 \leq x \leq 2007$

- 18) For the graph given below:



Part A

State the domain.

Answer: $\{x \mid -3 \leq x \leq 3\}$

Part B

State the range.

Answer: $y = -1, 2$

Part C

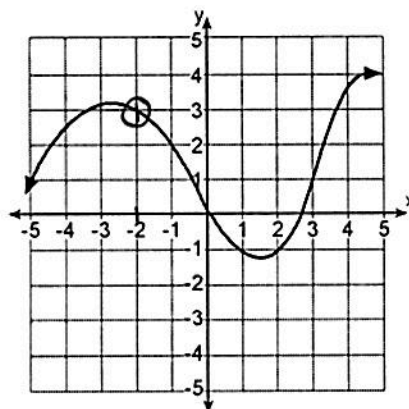
State whether or not the graph represents a function.

Justify your answer.

No, it fails the vertical line test when $x = -1$

Question 19 refers to the following:

Given the graph below of $y = f(x)$.



- 19) According to the graph shown, what is the value of $f(-2)$?

A) 1

B) -1

C) 3

D) -2

- 20) Given the function $g(x) = x^2 - 2x + 1$, find the value of $g(1)$.

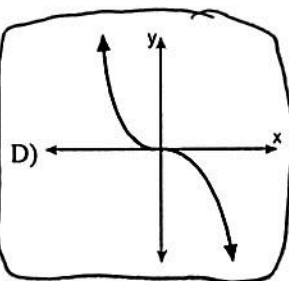
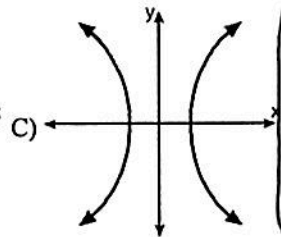
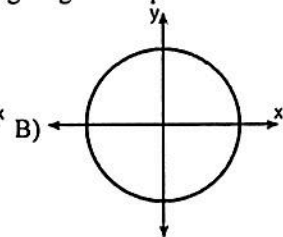
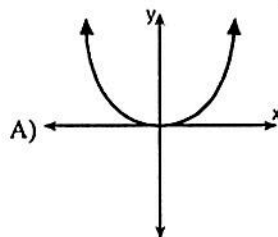
Show all work.

$$\begin{aligned} g(1) &= 1^2 - 2(1) + 1 \\ &= 1 - 2 + 1 \end{aligned}$$

Answer: _____

0

- 21) Which one of the following diagrams represents a one-to-one function?



Passes
Both
Vertical
and
Horizontal
test.

- 22) If $f(x) = \frac{1}{2}x - 3$ and $g(x) = 2x + 5$, what is the value of $(g \circ f)(4)$?

A) 3.5

B) 6

C) 3

D) -13

- 23) If $f(x) = 3x - 1$ and $g(x) = 4x + 3$, what does $g(f(x))$ equal?

A) $12x^2 + 13x - 3$

B) $12x + 8$

C) $12x^2 + 5x - 3$

D) $12x - 1$

$$\begin{aligned} 22) \quad f(4) &= \frac{1}{2}(4) - 3 = -1 \\ g(-1) &= 2(-1) + 5 = 3 \end{aligned}$$

$$\begin{aligned} 23) \quad f(x) &= 3x - 1 \\ g(3x - 1) &= 4(3x - 1) + 3 \\ &= 12x - 4 + 3 \\ &= 12x - 1 \end{aligned}$$

- 24) If $g(x) = x + 3$ and $f(x) = x^2 - 2$, find the value of $f(g(3))$.

Show all work.

$$g(3) = 3 + 3 = 6$$

$$f(6) = 6^2 - 2 = 36 - 2 = \boxed{34}$$

Answer: _____

- 25) If $f(x) = x^2 - 6$ and $g(x) = 2^x - 1$, determine the value of $(g \circ f)(-3)$.

Show all work.

$$f(-3) = (-3)^2 - 6 = 9 - 6 = 3$$

Answer: _____

$$g(3) = 2^3 - 1$$

$$= \boxed{7}$$